Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) A grating-outcoupled microcavity disk resonator, defining a plane and having a substantially smooth curved outer periphery, bounded by reflective walls, around and within which light can circulate, the resonator including at least one buried grating region disposed in the plane of the grating-outcoupled microcavity disk resonator, the grating region having a substantially symmetric cross-sectional profile and serving to outcouple light circulating within the curved outer periphery into free space modes propagating out of the plane of the resonator.

2. (Original) The grating-outcoupled microcavity disk resonator of claim 1, wherein the grating region is a set of periodic features formed in or on a cladding layer of the resonator.

3. (Currently Amended) The grating-outcoupled microcavity disk resonator of claim 2, wherein the periodic features have at least one of a trapezoidal shape, a rectangular shape, and a sinusoidal ~~shape, and a sawtooth~~ shape.

4. (Withdrawn) The grating-outcoupled microcavity resonator of claim 1, wherein the grating region exists in at least one region near the outer periphery.

5. (Withdrawn) The grating-outcoupled microcavity disk resonator of claim 4, wherein each of the at least one region includes a grating having a periodicity that is different from the other regions.

6. (Withdrawn) The grating-outcoupled microcavity disk resonator of claim 1, wherein the grating region extends around an entire circumference of the resonator.

7. (Original) The grating-outcoupled microcavity disk resonator of claim 1, wherein the grating region forms at least a second-order grating.

8. (Previously Presented) The grating-outcoupled microcavity disk resonator of claim 1, wherein the grating region forms a distributed feedback grating.

9. (Withdrawn) The grating-outcoupled microcavity disk resonator of claim 1, wherein the grating region includes dielectric material formed in stripes on or over a waveguide layer.

10. (Withdrawn) The grating-outcoupled microcavity disk resonator of claim 1, wherein the grating region includes conductive material formed in stripes on or over a cladding layer, wherein the conductive material is at least one of at least one metal layer and a conductive oxide.

11. (Withdrawn) The grating-outcoupled microcavity disk resonator of claim 1, wherein the grating region includes conductive material formed in stripes on or over a top electrode layer.

12. (Withdrawn) The grating-outcoupled microcavity disk resonator of claim 1, wherein the grating region comprises a set of pillars separated by voids.

13. (Withdrawn) The grating-outcoupled microcavity disk resonator of claim 12, wherein the pillars are at least one of rectangular, trapezoidal, and sinusoidal in shape.

14. (Withdrawn) The grating-outcoupled microcavity disk resonator of claim 12, wherein the grating region has a dielectric material filling the voids between the parallel pillars.

15. (Withdrawn) The grating-outcoupled microcavity disk resonator of claim 1, further comprising a reflective layer associated with the grating region.

16. (Withdrawn) The grating-outcoupled microcavity disk resonator of claim 15, wherein the reflective layer reflects a wave which constructively interferes with a diffracted wave generated by the grating region.

17. (Withdrawn) The grating-outcoupled microcavity disk resonator of claim 15, wherein the reflective layer is displaced by a multiple of about $\lambda/2$ from the grating region, wherein λ is a wavelength of the light traveling within the disk resonator.

18. (Original) The grating-outcoupled microcavity disk resonator of claim 1, wherein the grating region is a set of periodic features formed in an upper cladding layer of the grating-outcoupled microcavity disk resonator.

19. (Previously Presented) The grating-outcoupled microcavity disk resonator of claim 1, wherein the grating region is formed in both an upper cladding layer and an upper waveguide layer of the grating-outcoupled microcavity disk resonator.

20. (Previously Presented) The grating-outcoupled microcavity disk resonator of claim 1, wherein the at least one grating region includes a first grating region formed in a top cladding layer and a second grating region formed in a bottom cladding layer of the grating-outcoupled microcavity disk resonator.

21. (Withdrawn) The grating-outcoupled microcavity disk resonator of claim 1, wherein the grating-outcoupled microcavity disk resonator further comprises a plurality of grating-outcoupled microcavity disk resonators, each grating-outcoupled microcavity disk resonator defining a plane and each grating-outcoupled microcavity disk resonator having at least one grating region disposed in the plane of that grating-outcoupled microcavity disk resonator, each at least one grating region serving to outcouple light circulating in the corresponding grating-outcoupled microcavity disk resonator in a direction out of the plane of that grating-outcoupled microcavity disk resonator.

22. (Withdrawn) The grating-outcoupled microcavity disk resonator of claim 21, wherein each of the plurality of grating-outcoupled microcavity disk resonators resonates at a different wavelength.

23. (Withdrawn) The grating-outcoupled microcavity disk resonator of claim 21, wherein each of the plurality of grating-outcoupled microcavity disk resonators has a different diameter.

24. (Withdrawn) The grating-outcoupled microcavity disk resonator of claim 21, wherein the plurality of grating-outcoupled microcavity disk resonators are stacked concentrically.

25. (Original) The grating-outcoupled microcavity disk resonator of claim 1, wherein the grating-outcoupled microcavity disk resonator comprises a III-V nitride semiconductor heterostructure formed on a substrate.

26. (Original) grating-outcoupled microcavity disk resonator of claim 25, wherein the substrate comprises at least one of sapphire, silicon carbide, GaN, AlGaN, AlN, and silicon.

27. (Withdrawn) The grating-outcoupled microcavity disk resonator of claim 25, wherein the III-V nitride semiconductor heterostructure comprises at least one quantum well.

28. (Original) The grating-outcoupled microcavity disk resonator of claim 1, wherein the grating-outcoupled cavity resonator comprises a heterostructure formed using at least one of GaAs, InAs, AlAs, InP, AlP, and GaP.

29. (Original) The grating-outcoupled microcavity disk resonator of claim 1, wherein the grating-outcoupled microcavity disk resonator comprises a heterostructure formed using at least one of InGaAs, AlGaAs, InAlAs, InGaAsP, InGaP, and InAlP.

30. (Original) The grating-outcoupled microcavity disk resonator of claim 1, wherein the grating-outcoupled microcavity disk resonator comprises a heterostructure formed using at least one of ZnSe, CdS, MgS, MgSe, CdSe, CdTe, ZnO, and MgO.

31. (Withdrawn) The grating-outcoupled microcavity disk resonator of claim 1, wherein a central portion of the grating-outcoupled microcavity disk resonator has been removed.

32. (Withdrawn) The grating-outcoupled microcavity disk resonator of claim 31, wherein a remaining portion of the grating-outcoupled microcavity disk resonator is an annulus.

33-50. (Canceled)

51. (New) The grating-outcoupled microcavity disk resonator of claim 1, further comprising:

a first waveguide layer;

a quantum-well active layer; and

a second waveguide layer on the other side of the quantum-well active layer from the first waveguide layer.

52. (New) The grating-outcoupled microcavity disk resonator of claim 51, further comprising:

a first cladding layer on the other side of the first waveguide layer from the quantum-well active layer, the grating region formed in the vicinity of the interface between the first waveguide layer and the first cladding layer.

53. (New) The grating-outcoupled microcavity disk resonator of claim 52, further comprising:

a carrier confinement layer between the first waveguide layer and the quantum-well active layer,

the refractive index of the first waveguide layer being larger than the refractive index of the carrier confinement layer and smaller than the refractive index of the first cladding layer.

54. (New) The grating-outcoupled microcavity disk resonator of claim 53, further comprising:

a second cladding layer on the other side of the second waveguide layer from the quantum-well active layer,

the refractive index of the second waveguide layer being larger than the refractive index of the refractive index of the second cladding layer and smaller than the refractive index of the quantum-well active layer.

55. (New) The grating-outcoupled microcavity disk resonator of claim 54,

the first and second waveguide layers, the quantum-well active layer, the first and second cladding layers, and THE carrier confinement layer each being made from a III-V nitrade material.

56. (New) The grating-outcoupled microcavity disk resonator of claim 55,

the second waveguide layer being selected from the group consisting of:

n-type (In)GaN:Si, (In)GaN-undoped, AlGaN, and AlGaInN.

57. (New) The grating-outcoupled microcavity disk resonator of claim 55,

the quantum-well layer being (In)(Al)GaN.

58. (New) The grating-outcoupled microcavity disk resonator of claim 55,

the second waveguide layer being selected from the group consisting of:

p-type (In)GaN:Mg, (In)GaN:undoped, AlGaN, and AlGaInN.

59. (New) The grating-outcoupled microcavity disk resonator of claim 55,

the carrier confinement layer being p:type $Al_x Ga_{1-x}N$:Mg with an Al mole fraction in the range of x=0.5 to x=0.4.

60. (New) The grating-outcoupled microcavity disk resonator of claim 55,

the first cladding letter being p:type AlGaN:Mg.

61. (New) The grating-outcoupled microcavity disk resonator of claim 55, the second cladding layer being n:type (In)AlGaN or n:type AlGaN:Si.